

CLAIMS

1. A lithium ion capacitor comprising a positive electrode, a negative electrode and an aprotic organic solvent electrolyte solution of a lithium salt as an electrolytic solution, characterized in that a positive electrode active material is a material capable of reversibly supporting lithium ions and/or anions, a negative electrode active material is a material capable of reversibly supporting lithium ions, the negative electrode and/or the positive electrode are doped with lithium ions so that the potential of the positive electrode is at most 2.0 V after the positive electrode and the negative electrode are short-circuited, and the electrolytic solution contains vinylene carbonate or its derivative.
2. The lithium ion capacitor according to Claim 1, wherein the positive electrode and/or the negative electrode have a current collector having pores penetrating from the front surface to the back surface, and are doped with lithium ions by electrochemical contact of the negative electrode with a lithium ion supply source.
3. The lithium ion capacitor according to Claim 1 or 2, wherein the negative electrode active material has a capacitance per unit weight at least three times that of the positive electrode active material, and the weight of the positive electrode active material is larger than the

weight of the negative electrode active material.

4. The lithium ion capacitor according to any one of Claims 1 to 3, wherein the electrolytic solution contains vinylene carbonate or its derivative in an amount of at most 5 wt%.

5. The lithium ion capacitor according to any one of Claims 1 to 4, wherein the aprotic organic solvent is a mixture of a cyclic carbonate with a chain carbonate.

6. The lithium ion capacitor according to any one of Claims 1 to 5, wherein the aprotic organic solvent is a mixture of ethylene carbonate, propylene carbonate and diethyl carbonate.

7. The lithium ion capacitor according to any one of Claims 1 to 6, wherein the lithium salt is LiPF_6 , $\text{LiN}(\text{C}_2\text{F}_5\text{SO}_2)_2$ or $\text{LiN}(\text{CF}_3\text{SO}_2)_2$.